

REMARKS

Reconsideration of the present application is respectfully requested on the basis of the following particulars.

1. Rejection of claim 1 under 35 U.S.C. § 112, second paragraph

In the amendment of claim 1, the term “hard glue” is qualified to indicate that it has “properties that substantially transfer the vibrations of the piezoceramic disk to the membrane.”

Support for the amendatory language is provided in the written specification by contrasting the hard glue with a “flexible glue” which is discussed on page 5, lines 1-4 and page 7, lines 6-17. In the description of the flexible glue, the specification indicates that in prior art speakers, a flexible glue can lower the frequency of resonance and attenuate the peaks of the frequency of resonance to move them to another frequency. It is to be noted that in these prior art speakers the membrane is a metal disk (page 2, lines 3-4; page 7, lines 13-17).

As is explained in the specification, it is desired to provide a membrane that itself is a relatively flexible material that attenuates sound vibrations (page 7, lines 25-31). Hence, unlike in the discussed prior art speakers wherein it is the glue that is flexible and attenuates sound vibrations, it is the membrane itself in the present invention that primarily serves to attenuate the sound vibrations.

In the construction of the present invention, it is thus desirable that the inventive speaker possess a flat frequency characteristic (page 7, line 27 through page 8, line 9). This is achieved by assembling the piezoceramic disk onto the membrane with a hard glue. By using the hard glue, unlike in the prior art speakers, the vibrations of the piezoceramic disk are substantially transferred to the membrane.

As shown in the electric scheme of FIG. 9, the mechanical losses in the glue layer play a significant role in the resonance of the inventive transducer. More specifically, it is explained that the load of the polymeric plate and the solid attachment of the piezoceramic disk prevent resonance (page 11, lines 28-32). Of course, such solid attachment of the piezoceramic disk to the membrane is achieved by way of the hard glue and not a flexible glue, as used in the prior art speakers. Thus, vibrations are substantially transferred from the piezoceramic disk to the membrane in order to achieve the desired properties of the inventive transducer.

In view of these observations, it is apparent that the specification provides sufficient support for the hard glue and its desired properties. Accordingly, it is submitted that the amendment to claim 1 makes the recitation of a "hard glue" sufficiently clear and definite. Withdrawal of this rejection is therefore respectfully requested.

2. Rejection of claims 1-4, 6-7 and 9-21 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,266,426 (Azima et al. I)

This rejection is respectfully traversed on the basis that the Azima et al. I reference fails to disclose or suggest the transducer according to claim 1 of the pending application. More specifically, the Azima et al. I reference does not teach a transducer having a one or multiple piece piezoceramic disk secured to a membrane formed of an elastomeric material by a hard glue. Claims 2-4, 6-7 and 9-21, which depend directly or indirectly from claim 1, are patentable based on their dependency from claim 1 and their individually recited features.

In the following observations, it will be pointed out that the Azima et al. I reference teaches an acoustic device that is substantially different from the transducer of the present application. In particular, it will be shown that this rejection is misplaced in that the Azima et al. I reference relies on the teachings of U.S. application 09/011,831 (now U.S. Patent 6,151,402 - Azima et al. II) for the basis of

the transducer discussed therein (col. 2, lines 48-56). It is readily evident from the description in the Azima et al. II reference that the transducer does not have the same features of the transducer of claim 1 of the pending application. Moreover, it will be pointed out that the acoustic device of the Azima et al. I reference does not function in the same way and does not produce the same result as the transducer of claim 1.

Turning to the transducer described by the Azima et al. I reference, this transducer is more fully described in the Azima et al. II reference. In observing FIGS. 3 and 4 of the Azima et al. II reference, the transducer 9 comprises a coil 13 that is rigidly fixed on the outside of a coil former 18 which in turn is rigidly bonded to a surface skin 21 of a radiator panel 2. A magnet 15 is enclosed by a pair of poles 14, one of which is close to the interior of the coil former 18 and the other of which is near the peripheral flange 90 surrounding the coil 13 (col. 5, lines 33-40).

In view of this basic description of the transducer in the Azima et al. II reference, it is clear that the transducer referred to in the Azima et al. I reference does not possess the same features of the recited transducer of claim 1 of the pending application. The coil and magnet assembly of Azima et al. I are simply not the same as a piezoceramic disk. Thus, the Azima et al. I reference cannot be construed to disclose or suggest a piezoceramic disk that is secured to an elastomeric membrane with a hard glue.

The Azima et al. I and Azima et al. II references provide no suggestion that would motivate a skilled artisan to make the transducer according to the present application. To the contrary, these prior art references describe a transducer that includes a coils and magnets that are secured to a panel and which operate to generate sound in a manner substantially different from the manner provided by the inventive transducer.

The Azima et al. I reference describes the acoustic device as launching bending waves into the panels to cause them to resonate to produce an acoustic output (col. 5, lines 26-29). A skilled artisan would readily recognize that the transducer according to the pending application is of the near pistonic and local area excited type and has essentially point source coherent radiation characteristics.

In the Action, it is indicated that it would have been obvious to a skilled artisan to firmly bond a piezoceramic disk onto an elastomeric membrane with a hard glue. To the extent that the Examiner is relying on "well known art" to supply teachings with respect to certain types of adhesives to secure the piezoceramic disk onto the elastomeric membrane, it is respectfully requested that the Examiner cite such art pursuant to MPEP § 2144.03. The applicant is unable to assess the teachings of such art until it is identified.

It is submitted that a skilled artisan would not be sufficiently motivated by the Azima et al. I reference to secure a piezoceramic disk onto an elastomeric membrane with a hard glue since the Azima et al. I reference does not describe a transducer having a piezoceramic disk. Hence, the problem to be solved and the improvement of the transducer according to claim 1 does not exist within the same context as in the transducer of the Azima et al. I reference, and more specifically the transducer of the Azima et al. II reference.

In view of these observations, it is respectfully submitted that the Azima et al. I reference does not render pending claims 1-4, 6-7 and 9-21 obvious since this reference fails to disclose and suggest each and every feature of the transducer of claim 1. Withdrawal of this rejection is therefore courteously requested.

3. Conclusion

In view of the amendment of claim 1, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance.

Application No.: 09/901,635

Examiner: Suhan Ni

Art Unit: 2643

Accordingly, it is respectfully requested that each and every pending claim in the present application be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the Applicant's Attorney, the Examiner is invited to contact the undersigned at the numbers shown below.

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Date: October 20, 2004

Respectfully submitted,



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